

PATENT SPECIFICATION

1,036,492

DRAWINGS ATTACHED.

1,036,492



Date of filing Complete Specification: April 26, 1965.

Application Date: May 4, 1964. No. 18384/64.

Complete Specification Published: July 20, 1966.

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Index at Acceptance:—B7 VIH; F2 U(2A3B, 2B1).

Int. Cl.:—B 63 h //F 06 d.

COMPLETE SPECIFICATION.

Improvements in or relating to a Marine Propeller Assembly and a Method of Mounting Same.

I, JOHN MICHAEL LANGHAM, of 21, Beechcroft, Chislehurst, Kent, a British Subject, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to marine propeller assembly and a method of mounting same.

The known method of mounting a marine propeller, having a tapered bore, on a shaft includes the use of a key and keyway to ensure that there is no angular movement. With such a method it is often difficult to remove the propeller from the shaft without damage to the parts, due to the fact that the tapered bore is driven up hard onto the shaft. Furthermore, because of the different coefficient of expansion of the steel shaft and bronze and alloy propeller, it is common for the propeller to slide along the keyway in a longitudinal direction when the ship and vessel is operating in waters where the temperature is greater than where the propeller was fitted.

An object of the invention is to provide a marine propeller assembly which eliminates the need for a key and keyway and thus the possibility of shaft failure resulting from stress corrosion cracking in turn resulting from stress raisers formed by the keyway.

A further object of the invention is to provide a method of mounting a marine propeller which facilitates the easy removal thereof from the shaft.

A still further object of the invention is to avoid the longitudinal movement which occurs due to the differential expansion.

The invention consists in a marine propeller and propeller shaft assembly com-

prising a propeller shaft having a machined parallel portion, a high strength bronze sleeve shrunk onto the parallel portion of the shaft, the outer surface of the sleeve being formed with a taper and a propeller having a tapered bore corresponding to the tapered sleeve, which propeller is adapted to be driven up hard onto the sleeve by means of a power operated nut.

Preferably the maximum outside diameter of the sleeve is smaller than the nominal shaft diameter, to enable the shaft to be withdrawn inboard through a stern tube bearing of the shaft assembly.

The invention further consists in a method of mounting a marine propeller on a propeller shaft comprising, shrinking a tapered high strength bronze sleeve onto a machined parallel portion of a propeller shaft, to form a tapered portion on said shaft, boring the shaft receiving bore of the propeller with a corresponding taper to the sleeve and driving the tapered bore of the propeller up hard onto the tapered sleeve by means of a power operated nut.

The invention will be further described by way of example, with reference to the accompanying drawings showing two preferred embodiments of a propeller and propeller shaft assembly, in which

Figure 1 is an axial section through a propeller boss mounted on a shaft according to one embodiment of the invention;

Figure 2 is a similar view to Figure 1 of a second embodiment of the invention.

Referring to the drawings Figure 1 shows a first embodiment of the invention comprising a propeller shaft 1 one end of which has a machined parallel portion 2 having a smaller diameter than nominal diameter of the shaft 1. A high strength bronze sleeve

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3 having a tapered outer surface is heated and shrunk onto the parallel portion 2 of the shaft 1. This sleeve 3 forms, in effect a permanent taper on the shaft with a maximum outside diameter not greater than the nominal shaft diameter, which enables the shaft 1 and sleeve 3 to be withdrawn inboard through the stern tube bearing (not shown) of the shaft assembly.

A propeller boss 4 which has a lightening chamber 5 has its shaft receiving bore 6 bored with a corresponding taper to the outer surface of the sleeve 3 and is driven up hard onto the tapered sleeve by a power operated nut 7. This arrangement eliminates differential contraction and expansion problems which may arise as well as eliminating the need for a key and keyway.

The propeller can be readily removed from the bronze sleeve 3 of the shaft 1 by reversing the operation of the power operated nut 7. Alternatively, the propeller boss 4 can incorporate heating means forming the subject of my co-pending Application No. 18383/64 (Serial No. 1034984) which are capable of expanding the propeller boss to facilitate the removal of the propeller from the shaft 1.

In the embodiment illustrated in Figure 2, in which like parts have the same reference numerals as in Figure 1, the machined parallel portion of the shaft has substantially the same diameter as the nominal diameter of the remainder of the shaft 1. The tapered bronze sleeve 3 is heated and shrunk onto the machined portion of the shaft such that the external diameters of the sleeve ends are greater than that of the shaft 1.

It is an advantage of the invention that the weight of the propeller is effectively reduced with a corresponding reduction in its cost.

WHAT I CLAIM IS:—

1. A marine propeller and propeller shaft assembly comprising a propeller shaft having a machined parallel portion, a high strength bronze sleeve shrunk onto the parallel portion of the shaft, the outer surface of the sleeve being formed with a taper and a propeller having a tapered bore corresponding to the tapered sleeve, which propeller is adapted to be driven up hard onto the sleeve by means of a power operated nut.

2. An assembly as claimed in claim 1, in which the outside diameter of the sleeve is smaller than the nominal shaft diameter, to enable the shaft to be withdrawn inboard through a stern tube bearing of the shaft assembly.

3. A method of mounting a marine propeller on a propeller shaft comprising, shrinking a tapered high strength bronze sleeve onto a machined parallel portion of a propeller shaft, to form a tapered portion on said shaft, boring the shaft receiving bore of the propeller with a corresponding taper to the sleeve and driving the tapered bore of the propeller up hard onto the tapered sleeve by means of a power operated nut.

4. A marine propeller and propeller shaft assembly, substantially as hereinbefore described with reference to and as shown by Figures 1 or 2 of the accompanying drawings.

5. A method of mounting a marine propeller on a propeller shaft, substantially as hereinbefore described with reference to the accompanying drawings.

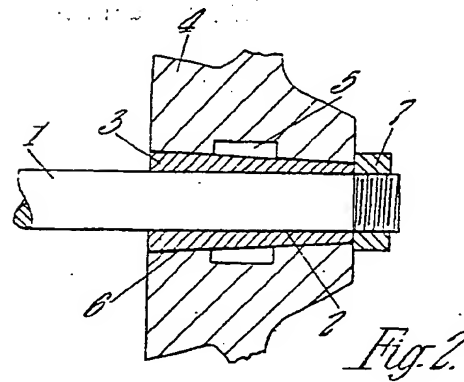
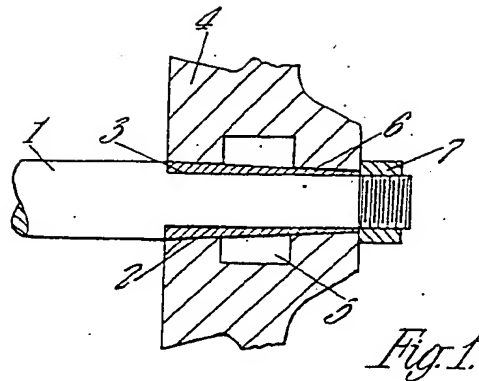
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COMPLETE SPECIFICATION

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